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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LEE, CYNTHIA K

ART UNIT

PAPER NUMBER

1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/555,657	Applicant(s) OHATA ET AL.	
	Examiner CYNTHIA LEE	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-9,16-22 and 25-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-9,16-22 and 25-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

This Office Action is responsive to the amendment filed 3/12/2009. Claims 1, 4-9, 16-22 and 25-27 are pending. Claims 26 and 27 have been added.

The Examiner notes that the rejection of claim 4 was unclear in the previous Office Action. Claims 1, 4-9, 16-22, and 25-27 are non-finally rejected to clarify the rejection of claim 4.

Claims Analysis

To avoid 35 USC 112, 2nd paragraph issues, the limitation "indefinite-shape particle" has been defined as "shapes having knots, bumps, or bulges based on the primary particles, that is, for example, shapes like dendrite, grape clusters, or coral, unlike shapes that are spherical or egg-shaped, or that are similar to such shapes" as supported by the Specification pg 5 paragraph [0009].

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-6, 9, 16-22 and 25 are rejected 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Delnik (US 5948464), as evidenced by Walls, et. al., (Fumed silica-based composite polymer electrolytes: synthesis, rheology, and electrochemistry, Journal of Power Sources 89 (2000) 156-162).

Delnik discloses a secondary battery comprising a positive electrode, a negative electrode, a separator (applicant's porous electron-insulating layer) adhered to the anode and cathode. See fig 1. A separator is present comprising a fine porous film. The precursor separator solution comprises silica filler and a polymer binder (see Abstract). The separator comprises indefinite-shape particles comprising shapes of dendrites, grape clusters, or coral. See Fig. 2.

Regarding the limitation "a neck is formed between at least a pair of said single crystalline particles, said neck comprising the same material as said single crystalline particles", Delnick discloses of using fumed silica (Delnick's claim 5). It is noted that fumed silica consists of fused silica particles. See Walls, pgs 156. Thus, the fumed silica particles of Delnick inherently have indefinite shapes with "neck comprising the same material as said single crystalline particles" as claimed by Applicant.

Regarding claims 4 and 17, Delnick discloses that the particle size is between 0.01 um and 1.0 um (6:67). It is noted that an aggregation of several particles would results in "a primary particle" size of no more than 10 um.

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Claims 1,5,16,18,26 and 27 are rejected 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gozdz (US 5571634), as evidenced by Walls, et. al., (Fumed silica-based composite polymer electrolytes: synthesis, rheology, and electrochemistry, Journal of Power Sources 89 (2000) 156-162).

Gozdz discloses a secondary battery comprising a positive electrode, a negative electrode, a separator (applicant's porous electron-insulating layer) adhered to the anode and cathode. See fig 1. The precursor separator solution comprises fumed silica filler and a DBP (Applicant's polymer binder) (3:50-65).

Regarding the limitation "indefinite-shape particles comprising shapes of dendrites, grape clusters, or coral" and "a neck is formed between at least a pair of said single crystalline particles, said neck comprising the same material as said single crystalline particles", Gozdz discloses of using fumed silica or fumed alumina (3:57 and 4:10). It is noted that fumed silica consists of fused silica particles. See Walls, pgs 156. Thus, the fumed silica and fumed alumina fillers of Gozdz inherently have indefinite shapes with "neck comprising the same material as said single crystalline particles" as claimed by Applicant.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 8 is rejected under 35 U.S.C. 103(a) as obvious over Delnik (US 5948464) as applied to claim 1.

Delnik discloses all the elements of claims 1 and 16 and are incorporated herein. Delnik discloses that for a lithium-ion cell, the electrodes can be made of oxides and the anode is made of carbon (9:29-33). Delnik does not disclose that the lithium-ion battery comprises a non-aqueous electrolyte and a lithium salt. The Examiner notes that a lithium-ion battery commonly contains a non-aqueous solvent and a lithium salt in the solvent. It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a non-aqueous solvent and a lithium salt in the solvent to make a complete circuit in the battery.

Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as obvious over Delnik (US 5948464) as applied to claims 1 and 16, in view of Waterhouse (US 4363856).

Delnik discloses all the elements of claims 1 and 16 and are incorporated herein. Delnik does not disclose that the resin binder comprises a polyacrylic acid derivative. Delnik discloses that the resin comprises PVC, PVdF, and EPDM resin (7:5-15). However, Waterhouse teaches of using acrylic acid as a binder for the separator (3:35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute acrylic acid of Waterhouse for Delnik's resin because it has been held by the court that the selection of a known material based on its suitability for

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its intended use is *prima facie* obvious. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

Response to Arguments

Applicant's concern with respect to Koike has been clarified in the rejection above. Koike was inadvertently added to the rejection and thus, is removed.

Applicant's arguments with respect to the "neck formation" are not persuasive and thus, the Examiner's position is maintained. Applicant relies on Day and Khan to support. Applicant argues that Day discloses small spheroids and has no neck formation. Applicant argues that Khan's cross-linking of functional groups does not form a neck.

The Examiner notes that Walls et. al. is relied upon for evidence of "neck formation", and not Day or Khan. See rejection above. It is noted that Day discloses a "branching dendridic structure" (2:45). Although Khan does not expressly disclose a "neck formation", it does not necessarily imply that fused silica particles do not have a neck formation with "neck comprising the same material as said single crystalline particles".

Walls discloses that fused silica particles comprise "fused particles" and Day discloses (2:45) that "the spheroids are agglomerated in such a way that they form a backbone with branching dendritic structures" (emphasis added). Thus, both Walls et.

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al. and Day disclose a neck formation with “neck comprising the same material as said single crystalline particles”.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Lee/
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art
Unit 1795